

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. 93-016
SITE CLEAN-UP REQUIREMENTS FOR:
CHEVRON U.S.A., INC., RICHMOND REFINERY
S.P. HILL TANKFIELD, BAYSIDE SECTOR
RICHMOND, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

Description of Discharger

1. Chevron U.S.A. - Richmond Refinery, a subsidiary of Chevron U.S.A. Inc., (hereinafter called the Discharger), owns and operates the Richmond Refinery. The refinery, which began operating at the turn of the century, produces a broad range of petroleum products. The 2,900 acre refinery is located along the southern shore of San Pablo Bay in Contra Costa County. The City of Richmond lies to the south of the facility. To the east and within one mile from the facility is industrial, residential, commercial and agricultural land use.

Existing Orders

2. The Board, on November 15, 1989, issued Updated Waste Discharge Requirements Order No. 89-175. That Order addresses refinery-wide requirements including requirements for the investigation and reporting of groundwater contamination resulting from the refining, storage and handling of petroleum products.
3. Other Orders issued for the Refinery are:
Order No. 92-111, NPDES permit for the refinery's discharge of treated waste water;
Order No. 92-092, Site Cleanup Requirements for the Alkane Sector;
Order No. 92-010, Waste Discharge Requirements for Landfill 15;
Order No. 91-098, Cease and Desist Order for Pollard Pond and the Hydropits; and
Order No. 90-146, Site Cleanup Requirements for Plant 1/Additives Plant.

S.P. Hill Tankfield Description

4. The discharger has submitted the "Hydrogeologic Investigation, Alkane, Office Hill, S.P. Hill, and Quarry Tankfields" report dated September 30, 1991. The report was submitted pursuant to Provision C.13 of Board Order No. 89-175 and finds that some of the aboveground petroleum storage tanks of the S.P. Hill Tankfield have released hydrocarbon constituents to the soil and the groundwater at this site.
5. The discharger has submitted the "Additional Hydrologic Investigation Workplan, S.P. Hill Tankfield" report dated April 6, 1992. The purpose of the report was to delineate the lateral extent of the free phase hydrocarbon and groundwater contamination identified by the previous investigation.

6. The S.P. Hill Tankfield presently consists of 16 above-ground tanks, with a total tankage capacity of more than one million barrels, in an area of approximately 50 acres. Of the 16 tanks, eleven have leak detection bottoms, usually steel over ribbed concrete. The tank contents are primarily finished products, such as gasoline and kerosene. Most of the tanks were first constructed 50 to 70 years ago, and some may have leaked in the past.

Hydrogeology

7. The S.P. Hill Tankfield is generally located on the western flank of the Potrero-San Pablo Ridge in a southwest-trending drainage basin. The site topography is steep to moderately steep terrain with bedrock commonly cropping out at the surface. The bedrock consists of sandstones, siltstones and shales of the Franciscan Formation, generally dipping 40 ° to 70 ° towards the southwest. Thin sedimentary units, overlying the bedrock, consist of alluvial/colluvial sandy clay which thickens bayward, to as much as 30 feet in some areas.
8. Groundwater occurs at a wide range of depths, ranging from localized, intermittent surface seeps to depths of as much as 150 feet below ground surface. Preliminary results from hydrogeologic investigations indicate that hydraulic conductivities in the fractured bedrock range from 2.6×10^{-5} cm/sec to 3.6×10^{-6} cm/sec. Based on measured hydraulic conductivities, groundwater flow rates through the fractured bedrock is approximately 0.5 foot per year.
9. The water quality for the site varies in total dissolved solids (TDS) from 3,000 mg/l to over 12,000 mg/l. Even though the water does not meet drinking water standards, it has potential for industrial uses.

Groundwater and Soil Contamination

10. Tank inspection records have determined that hydrocarbon releases have occurred from some tanks and pipelines in the S.P. Hill Tankfield. Shallow soils, which have since been removed, had localized and elevated levels of hydrocarbons and hazardous concentrations of metals, primarily lead in Basins 5, 6 and 7.
11. At the present time, well No. 366F has more than 7 feet of gasoline as a free-phase hydrocarbon in the well, indicating that free-phase hydrocarbon exists on the groundwater. The actual thickness of hydrocarbon within the formation is unknown, however, the actual thickness in the formation will be less than that in the well. The free-phase hydrocarbon has been analyzed and contains:
 - 0.6% benzene,
 - 2.7% toluene,
 - 1.6% ethylbenzene, and
 - 4.7% total xylenes.

The horizontal extent of the free phase hydrocarbon has not been determined, however groundwater at a downgradient well (345AT which is 700 feet downgradient and near Basin 7), contains benzene at 6.3 mg/l, ethylbenzene at 1.6 mg/l, and TPH (light) at 26 mg/l. The discharger has installed a free-phase hydrocarbon recovery system at well 366F as a remedial measure. The average

sustainable production rate for this well ranges from 0.5 to 1.5 gallons of product per day.

12. A groundwater seep on the northeast side of the tankfield contained elevated concentrations of the following gasoline components: benzene at 0.44 mg/l, ethylbenzene 0.10 mg/l and xylenes at 0.12 mg/l.
13. The discharger has instituted a Health and Safety Plan which satisfies the requirements of any environmental remedial activity imposed by this Board.

Basin Plan

14. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin, (Basin Plan), on December 11, 1991. The Basin Plan contains water quality objectives and this Order implements the water quality objectives stated in the Basin Plan.
15. The beneficial uses of the San Francisco Bay in the vicinity of the site are:
 - a. Navigation;
 - b. Contact and non-contact water recreation;
 - c. Commercial and sport fishing;
 - d. Wildlife and estuarine habitat;
 - e. Preservation of rare and endangered species;
 - f. Fish migration and spawning;
 - g. Shellfish harvesting; and,
 - h. Estuarine habitat.
16. Based on the low hydraulic conductivities and TDS values discussed above, the groundwater under the S.P. Hill Tankfield is not expected to have a beneficial use for municipal or domestic supply. The potential beneficial uses of groundwater underlying the S.P. Hill Tankfield are:
 - a. Industrial process water and service supply; and
 - b. Agricultural supply.
17. This Board hereby determines that the free phase petroleum hydrocarbon is a threat to the beneficial and potentially beneficial uses of the waters of the State.
18. This Board hereby determines that gasoline components dissolved into the groundwater beneath this site at levels greater than deemed acceptable by the Executive Officer, would be a threat to the beneficial and potentially beneficial uses of the waters of the State.

State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California"

19. On October 28, 1968, the State Water Resources Control Board adopted a resolution which calls for maintaining the existing high quality of State waters unless it is demonstrated that any change would be consistent with the maximum public benefit and not unreasonably affect beneficial uses.

Regional Board Resolution No. 88-160, "Regional Board Position on the Disposal of
Extracted Groundwater From Groundwater Clean-up Projects"

20. On October 19, 1988, the San Francisco Bay Regional Water Quality Control Board adopted a resolution to encourage dischargers to recycle, in some beneficial manner, any groundwater that has been extracted and remedied of contaminants. In addition, the resolution encourages minimization of the discharge of treated water to local receiving waters under a site's NPDES permit whenever possible.
21. Unless otherwise noted, any references to Sections and Articles refer to Chapter 15, Division 3, Title 23, CCR.

Cost Recovery

22. Pursuant to §13304 of the Water Code, the discharger is hereby notified that the Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required by this Order. The discharger shall reimburse the Board upon receipt of a billing statement for those costs.

Aboveground Petroleum Storage Act - APSA

23. Pursuant to §25270.9 and §25270.11 of Chapter 6.67, Division 20 of California's Health And Safety Code, the discharger shall be liable to reimburse the State, to the extent of reasonable costs actually incurred, for overseeing or contracting for cleanup or abatement, of the groundwater and soil contaminations as found in the findings above.

California Environmental Quality Act

24. This action is an Order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to §15321, Title 14, CCR.

Notification of Public Meeting

25. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code §13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
26. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that pursuant to authority in Section 13304 of the California Water Code, the discharger, its agents, successors and assigns that currently or in the future own this land or operate this facility, shall clean up and abate the effects described in the findings above as follows:

A. Prohibitions

1. The discharge, storage, or treatment of waste, or materials which may impact the beneficial uses of the ground and surface water, shall not be allowed to

create a condition of pollution or nuisance as defined in Sections 13050 (l) and (m), of the California Water Code.

2. Migration of chemical constituents through subsurface transport to waters of the State, at concentrations exceeding cleanup goals, is prohibited.
3. The discharge of pollutants onto land, into the groundwater or into surface waters, except as permitted under the National Pollutant Discharge Elimination System, is prohibited.

B. Specifications

1. Free phase hydrocarbons shall be removed from the subsurface as expeditiously as possible. The discharger shall consider several methods to remove the product and evaluate those methods to determine which would be the most cost effective and efficient method to use. The discharger shall choose the method(s) to achieve this specification but the discharger shall obtain concurrence on the method actually used, from the Executive Officer.
2. If groundwater extraction is to be considered, the discharger will attempt to maintain a consistent groundwater "drawdown" such that "smearing" of the contaminant is minimized. Extraction volumes shall be reported on a gallons-per-day basis, of water and contaminant.
3. Groundwater cleanup goals shall be proposed by the discharger and subject to Executive Officer approval. The discharger may consider the use of a risk assessment study in preparation of the cleanup goals proposed.
4. The discharger is hereby given notice to be aware of, and consider, the following cleanup and abatement methods or combinations thereof:
 - A. In-place treatment of soil, bedrock or water:
 1. Bioremediation;
 2. Aeration; and
 3. Fixation.
 - B. Extraction of water, or vapors for on-site or off-site treatment by the following techniques:
 1. Bioremediation;
 2. Thermal destruction;
 3. Aeration;
 4. Sorption;
 5. Precipitation, flocculation, and sedimentation;
 6. Filtration;
 7. Fixation; and
 8. Evaporation.
 - C. Prevention of off-site migration of contaminated groundwater.

5. The discharger shall propose dissolved and free-phase hydrocarbon cleanup goals acceptable to the Executive Officer. The discharger will perform cleanup and abatement activities until cleanup goals have been achieved. The discharger will attempt to minimize migration of contaminants from any identified source, or area of highest concentration, during cleanup and abatement activities.
6. If the discharger has caused the soil and/or groundwater to be impacted outside of the facility's perimeter, the discharger is hereby required to extend the investigation and cleanup beyond the perimeter. The discharger may consider the use of a risk assessment study in preparation of the cleanup goals proposed.
7. During the clean-up period, no wastes shall be placed in a position where they can be carried from the unit into waters of the State.
8. The discharger is hereby required to provide documentation that any plan or report submitted pursuant to this Order shall be prepared by or under the direct supervision of a professional, qualified to prepare such reports. In addition, each component of the investigative and cleanup and abatement actions shall be conducted under the direction of appropriately qualified professionals.
9. All soil and groundwater samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analyses to be performed. All laboratories shall maintain quality assurance/quality control records for the Board Staff review.
10. The discharger shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

C. Provisions

1. The discharger shall comply with the Prohibitions and Specifications noted above, immediately upon adoption of this Order and according to the time schedule herein.
2. The discharger shall submit a report, acceptable to the Executive Officer, describing the findings and conclusions of the "Additional Hydrogeologic Investigation", (Finding 5). The investigative conclusions shall estimate the rate of migration and extent of the free phase hydrocarbon and groundwater contamination at the S.P. Hill Tankfield. The report shall include:
 - a. A comprehensive description of the investigation;
 - b. A description of the sampling and analysis used; and
 - c. A description of the quality assurance incorporated.

REPORT DUE: May 3, 1993

3. Pursuant to Specification B.1 and B.5 and consistent with B.2, the discharger shall propose a free phase hydrocarbon removal plan, acceptable to the Executive Officer. The discharger shall incorporate the findings from the investigation noted in C.2 and consider several free phase product extraction alternatives and their related overall costs, benefits and drawbacks. The proposed plan shall include:
 - a. A comprehensive description of the proposed cleanup and abatement activities;
 - b. An estimate of the volume of the free phase hydrocarbon to be extracted;
 - c. Cleanup goals for the free phase hydrocarbons;
 - d. A commitment and schedule to implement the workplan.

REPORT DUE: June 15, 1993

4. The discharger shall submit a report, acceptable to the Executive Officer, certifying completion of the installation and startup of the free phase hydrocarbon removal plan, as required above. The report shall, at a minimum, include initial pump and/or removal rates.

REPORT DUE: December 15, 1993

5. The discharger shall propose a groundwater remediation plan, acceptable to the Executive Officer. Pursuant to the above requirements, the plan shall consider several cleanup and abatement alternatives and their related overall costs, benefits, and drawbacks. The plan shall incorporate the findings from the investigation for Provision C.2 and consider the following:

- a. A comprehensive description of proposed cleanup, and abatement activities;
- b. Cleanup goals for the groundwater contamination;
- c. A sampling and analysis plan;
- d. A quality assurance, quality control plan; and
- e. A commitment and schedule to implement the workplan.

REPORT DUE: November 1, 1993

6. The discharger shall submit a report, acceptable to the Executive Officer, certifying completion of the installation and startup of the groundwater remediation plan, as required above.

REPORT DUE: May 16, 1994

7. The discharger shall submit a report, acceptable to the Executive Officer, certifying that the cleanup goals of Provisions C.3 and C.5 have been accomplished.

REPORT DUE: Within 90 days of extraction/remediation system shut down.

8. The discharger shall submit a proposal and time schedule, acceptable to the Executive Officer, to monitor the cleanup and abatement required by this Order.

REPORT DUE: December 15, 1993

9. The discharger shall file with this Board, monitoring reports performed according to any monitoring plan issued by the Executive Officer.
10. The discharger shall permit the Board, or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which may be relevant to the Order;
 - b. Access to copy any records required to be kept under the terms and conditions of this Order;
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order; and
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
11. The discharger shall maintain a copy of this Order at this site so as to be available at all times to site operating personnel.
12. These requirements do not authorize the commission of any act causing injury to the property of another or of the public, do not convey any property rights, do not remove liability under federal, State or local laws, and do not authorize the discharge of waste without the appropriate Federal, State, or local permits, authorizations, or determinations.
13. If the discharger is delayed, interrupted or prevented from meeting one or more of the time schedules in this Order due to circumstances beyond their reasonable control, the discharger shall promptly notify the Executive Officer. In the event of such delays, the Board will consider modification of the time schedules established in this Order.

I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order of the California Regional Water Quality Control Board, San Francisco Bay Region, on February 17, 1993.


STEVEN R. RITCHIE
Executive Officer

Attachments:

Figure 1- Site Location Map

Figure 2- S.P. Hill Tankfield Map

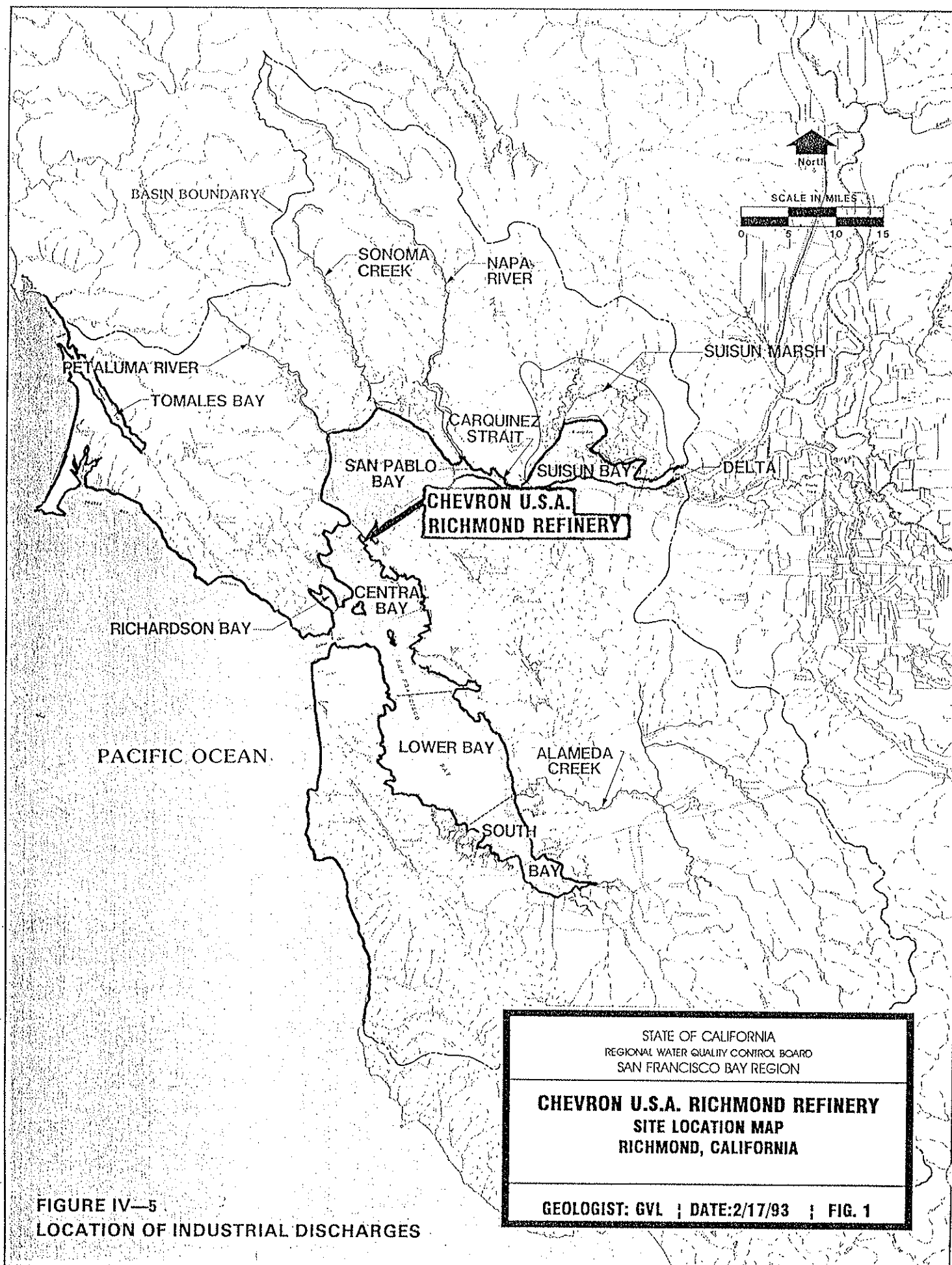
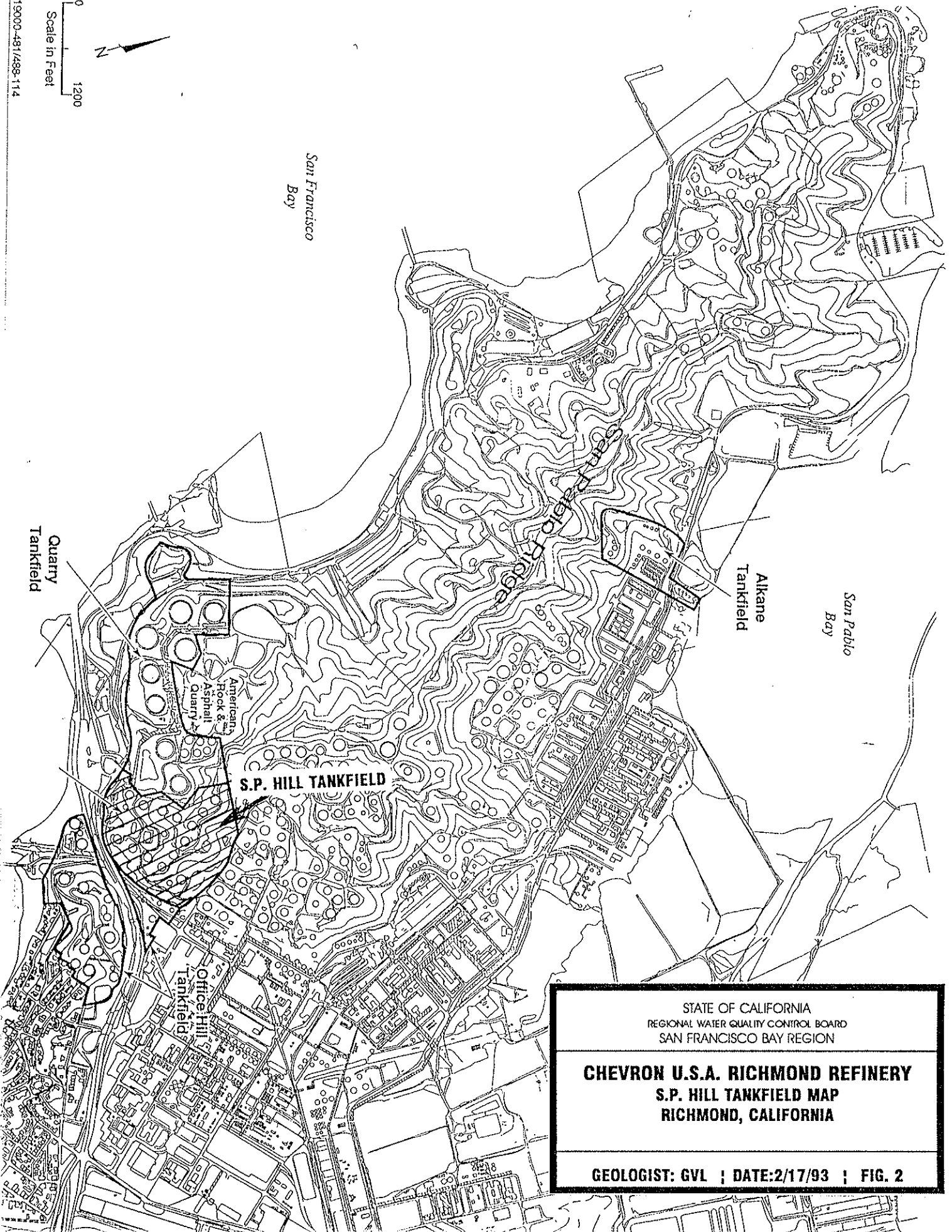
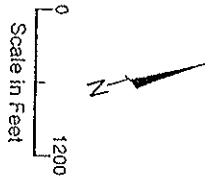


FIGURE IV—5
LOCATION OF INDUSTRIAL DISCHARGES



STATE OF CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION
CHEVRON U.S.A. RICHMOND REFINERY S.P. HILL TANKFIELD MAP RICHMOND, CALIFORNIA
GEOLOGIST: GVL ; DATE:2/17/93 ; FIG. 2